

Remarks

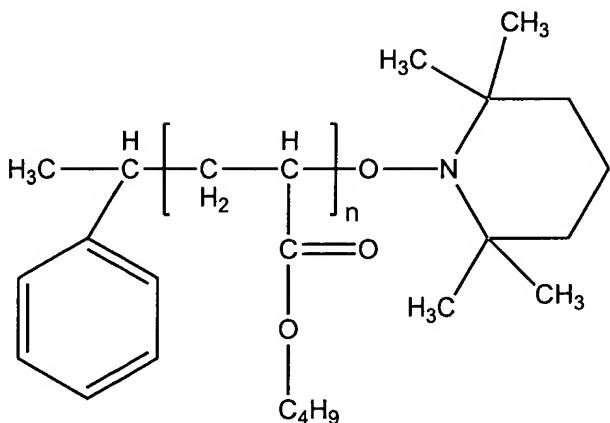
In the subject application, claims 286-319 are pending; of these, claims 286-305 and 314-317 have been withdrawn from consideration. Claims 306-313 and 318-319 are rejected in the Office Action. Claim 306, 307, and 308-313 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,891,971 issued to Keoshkerian et al. ("Keoshkerian") and claims are rejected under 35 U.S.C. §102(b) as being anticipated by Keoshkerian or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Keoshkerian.

Rejections Under 35 U.S.C. § 102 and 103(a)

In the Office Action, claims 306, 307, and 308-313 are rejected under 35 U.S.C. §102(b) as being anticipated by Keoshkerian. The Examiner states that Keoshkerian in Examples I and II discloses a block copolymer using the macromer of Example I which is prepared using TEMPO as a living radical initiator. The Examiner continues that because the block copolymer of Example II involves using the macromer of Example I which has a conversion of 65 percent, there is a reasonable basis that the claimed copolymers are inherently possessed in Keoshkerian. Applicants respectfully traverse the rejection.

Applicants herein describe the differences between the claimed polymers and the polymers prepared by Example I and II of Keoshkerian. In Example I of Keoshkerian, a homopolymer of n-butyl acrylate is produced. In a reaction medium including MB-TMP, dextrose, NaHCO₃, and n-butyl acrylate, the polymerization resulted in poly(n-butyl acrylate)-TEMPO of Mn=45,537 with a polydispersity of 1.55. The conversion of the monomer in the polymerization of Example I of Keoshkerian was 65% meaning that the 35% of the monomer

remained in the polymerization medium after the polymerization reaction was stopped. See Formula 1.



Formula 1

Example II describes a **Block Copolymerization** process to produce a poly(n-butyl acrylate-b-styrene). To prepare such a block copolymer, a polymer chemist could start with a living n-butyl acrylate polymer such as the shown in Figure 1, in other words, the polymer produced in Example I acts as the initiator of Example II. This is evidenced by the statement of the procedure described in Example II of Keoshkerian "Block Copolymerization The poly(n-butyl acrylate)-TEMPO (2.2 grams) of Example I was dissolved in styrene monomer (35 mL) . . . The resulting polymer of poly(n-butyl acrylate-b-styrene) has a MN=104,900 with PD-1.71." The procedure described in these Examples does not result in copolymerizing a second monomer into the polymer chain with a first monomer to form the second block as in the claimed invention. Such a polymer would not be designated as poly(n-butyl acrylate-b-styrene) but as poly(n-butyl acrylate-b-(co-n-butyl acrylate/styrene) indicating that the first monomer is continued to be polymerized after the second monomer is added.

This is evidenced by the procedure used in Example II. The Example clearly states that the poly(butyl acrylate)-TEMPO (2.2 grams) is added to the styrene. It does not state that any monomer is added, clearly indicating that the product of Example I is as the initiator of Example II. If the polymerization was to be conducted as claimed in the subject application, the styrene would have been added to the polymerization of Example I.

Further, Example II states that the poly(n-butyl acrylate) was dissolved in the styrene. Use of the term "dissolved" indicated that the poly(n-butyl acrylate) was a solid. For the poly(n-butyl acrylate) to be dissolved, it must have been isolated from the polymerization medium of Example I. This is consistent with the specification indicating that the block copolymers of Keoshkerian are "well defined block and multiblock copolymer thermoplastics" (see column 5, lines 38-44). The blocks copolymers of Keoshkerian comprise blocks of a single monomer and do not comprise blocks comprising both monomers. Applicants respectfully submit that the process describe in Keoshkerian and the process used in Examples I and II of Keoshkerian are patentably distinct from the claimed process and the polymers described in Keoshkerian are patentably distinct from the claimed polymers. This is emphasized in column 5, lines 33-44 of Keoshkerian, wherein the process is described as "repeatedly reacting the *resulting product* with successively added monomers which monomers *are different from the previously polymerized monomer* to form *well defined* block and multiblock copolymer thermoplastics.

The processes as presently claimed do not produce *well defined* blocks, as defined in Keoshkerian, but produce copolymers with a block

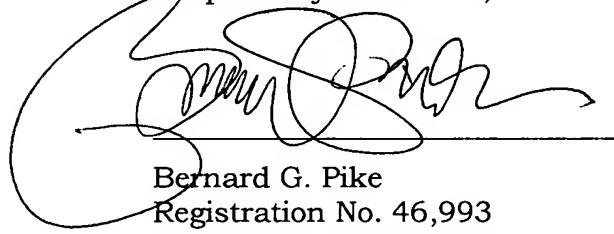
comprising two monomers as claimed in claims 308, (a third block synthesized from both the first and second monomers), 311 (wherein at least one block comprises a tapered copolymer), and 312 (wherein the concentration of the first monomer in the second block increases the greater the distance from the first block along the copolymer chain). Such processes and copolymers are not disclosed nor obvious (the above referenced sections of Keoshkerian actually teach away from the claimed processes and copolymers) based upon the disclosure of Keoshkerian.

The previous knowledge of one skilled in the art suggested that the amount of polymer that resides in a boundary layer between phases should be minimized. It was believed that the interfacial boundary layer was considered to be mandatory in order to improve the phase separation of A and B blocks of a block copolymer, especially if targeting thermoplastic elastomer applications. This was the apparent goal of Examples I and II of Keoshkerian to provide well defined block copolymers to limit the volume of the polymer residing at the interphase boundary layer. The claimed invention provides a block comprising at least two monomers so the block may be at least partially soluble in each phase, thereby increasing the volume of the inter phase boundary layer.

Conclusion

Applicants have made a diligent effort to fully respond to all the rejections and comments presented by the Examiner in the Office Action. Therefore, Applicants respectfully request that a timely Notice of Allowance be issued in the subject application. If the Examiner has any additional concerns regarding Applicants' present response, he is invited to contact Applicants' undersigned representative at the telephone number listed below so that those concerns may be expeditiously addressed.

Respectfully submitted,



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